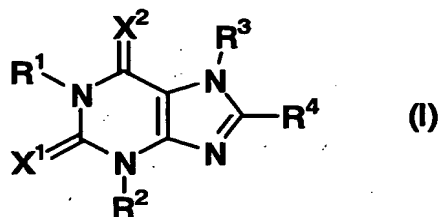


CLAIMS

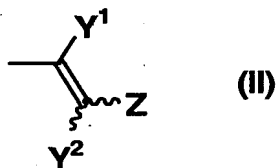
1. An agent for preventing and/or treating higher brain dysfunction comprising, as an active ingredient, a xanthine derivative represented by formula (I):



[wherein

R¹, R² and R³ are the same or different, and represent a hydrogen atom, lower alkyl, lower alkenyl or lower alkynyl;

R⁴ represents cycloalkyl, -(CH₂)_n-R⁵ (wherein R⁵ represents substituted or unsubstituted aryl, or substituted or a unsubstituted heterocyclic group; and n represents an integer of 0 to 4) or a group represented by formula (II):



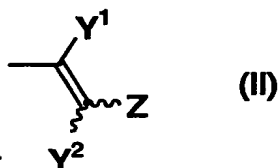
(wherein Y¹ and Y² are the same or different, and represent a hydrogen atom, halogen or lower alkyl; and Z represents substituted or unsubstituted aryl or a substituted or unsubstituted heterocyclic group);

X¹ and X² are the same or different, and represent an oxygen atom or a sulfur atom]

or a pharmaceutically acceptable salt thereof.

2. The agent for preventing and/or treating higher brain dysfunction according to claim 1, wherein X¹ and X² each is an oxygen atom.

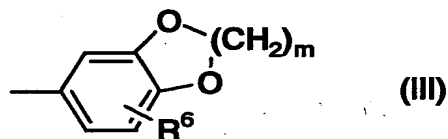
3. The agent for preventing and/or treating higher brain dysfunction according to the claim 1 or 2, wherein R^4 is a group represented by formula (II):



5 (wherein Y^1 , Y^2 and Z each have the same meanings as defined above).

4. The agent for preventing and/or treating higher brain dysfunction according to claim 3, wherein Y^1 and Y^2 are both hydrogen atoms.

10 5. The agent for preventing and/or treating higher brain dysfunction according to claim 3 or 4, wherein Z is substituted or unsubstituted aryl or a group represented by formula (III):



15 (wherein R^6 represents a hydrogen atom, hydroxy, lower alkyl, lower alkoxy, halogen, nitro or amino; and m represents an integer of 1 to 3).

20 6. The agent for preventing and/or treating higher brain dysfunction according to any one of claims 1 to 5, wherein the higher brain dysfunction is a higher brain dysfunction caused by brain injury.

7. The agent for preventing and/or treating higher brain dysfunction according to claim 6, wherein the brain injury is a brain injury due to aging.

25 8. The agent for preventing and/or treating higher brain dysfunction according to claim 6, wherein the brain injury is

a brain injury due to a disorder selected from the group consisting of head trauma and cerebrovascular accident.

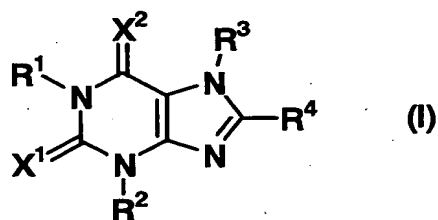
9. The agent for preventing and/or treating higher brain dysfunction according to any one of claims 1 to 8, wherein the higher brain dysfunction is an impairment of higher brain function selected from the group consisting of memory, thinking, recognition, action and learning.

10. The agent for preventing and/or treating higher brain dysfunction according to any one of claims 1 to 8, wherein the higher brain dysfunction is a brain dysfunction selected from the group consisting of agnosia, amnesia and apraxia.

11. The agent for preventing and/or treating higher brain dysfunction according to any one of claims 1 to 8, wherein the higher brain dysfunction is a memory impairment.

12. The agent for preventing and/or treating higher brain dysfunction according to any one of claims 1 to 8, wherein the higher brain dysfunction is a learning impairment.

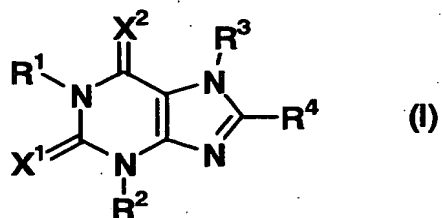
13. A method for preventing and/or treating higher brain dysfunction which comprises administering an effective amount of a xanthine derivative represented by formula (I):



[wherein R¹, R², R³, R⁴, X¹ and X² each have the same meanings as defined above]

or a pharmaceutically acceptable salt thereof.

14. Use of a xanthine derivative represented by formula (I):



[wherein R¹, R², R³, R⁴, X¹ and X² each have the same meanings as defined above]

or a pharmaceutically acceptable salt thereof for the
 5 manufacture of an agent for preventing and/or treating higher
 brain dysfunction.